1 Introduction

The M220 is a rugged and high portability industrial computer. The model is difference two levels. The ***high level*** is Intel Dothan LV 1.4G CPU + 855GME + ICH4 (+Optional ATI M11 discrete VGA controller with 64MB memory). And the ***low level*** is Intel Celeron ULV 900MHz CPU + 855GME Chipset + ICH4.

This system is based on PCI architecture, which have standard hardware peripheral interface. The power management complies with Advanced Configuration and Power Interface (ACPI 2.0). It also provides easy configuration through CMOS setup, which is built in system BIOS software and ***can be pop-up by pressing F2 at system start up or warm reset***. System also provides icon LEDs to display system status, such as Power indicator, HDD/CDROM, NUM LOCK, CAPS LOCK, SCROLL LOCK, SUSPEND MODE, Temperature indicator, Battery Low, Battery charging status and Battery complete.

The memory subsystem supports one JEDEC-standard 200-pin, small-outline, dual in-line memory module (SODIMM), support PC2100/PC2700 and up to 1GB DDR SDRAM.

The M220 includes the 855GME chipset components GMCH and the ICH4-M. The Accelerated Hub Architecture interface (the chipset component interconnect) is designed into the chipset to provide an efficient, high bandwidth, communication channel between the GMCH and the ICH4-M.

The GMCH component contains a processor system bus (PSB) controller, a graphics controller, and a memory controller, while providing an LVDS interface and two DVO ports/AGP controllers. The ICH4-M component integrates USB host controllers (supporting the USB 1.1 and USB 2.0 specification), an Ultra ATA 100/66/33 controller, a LAN controller, and an AC'97 digital controller, while providing interfaces for PCI and LPC devices,.

To provide for the increasing number of multimedia applications, the AC97 CODEC ALC203 is integrated onto the motherboard.

A full set of software drivers and utilities are available to allow advanced operating

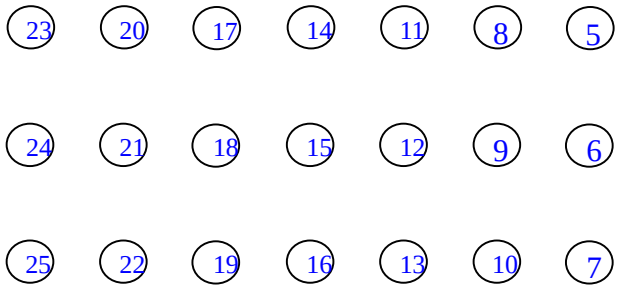
systems such as Linux 9.x, Windows2000 and Windows XP to take full advantage of the hardware capabilities such as bus mastering IDE, Windows2000-ready Plug & Play, and Advance configuration and power interface (ACPI 2.0).

Following chapters will have more detail description for each individual sub-systems and functions.

2 System Hardware Parts

Table 2.1 Internal Product Specification

CPU	- **High:** Intel Dothan LV Processor, 1.4 GHz, µ-FCBGA, 400MHz FSB, 2M FSB - **Low:** Intel Celeron ULV 900MHz CPU, µ-FCBGA, 400MHz FSB, 256K FSB
Core logic	- Intel 855GME Chipset + ICH4-M
Memory	- Two 200-pin PC2100/ PC2700 DDR SODIMM sockets - Easy changeable - Standard: 256MB DDR SDRAM, Max. : 2 GB, DDR SDRAM
VGA Controller	- **High:** Integrated in 855GME chipset, share system memory up to 64MB - Optional ATI M11 discrete VGA controller with 64MB memory - **Low:** Integrated in 855GME chipset, share system memory up to 64MB - 32bit 2D/3D graphic core with Dynamic Video Memory Technology - Dual View Function/ LCD/CRT simultaneous display capability
Display	- 14.1” TFT XGA (1024x768) Take SPWG type 14.1” LCD Take Hydis panel as the first solution Take Toppoly panel as the second solution Option 15.0” TFT XGA – Hydis Panel - Factory Optional Touch Screen - Factory Option Hi-Contrast solution
HDD	- Built in the system, easily removable for maintenance - Include HDD encryption feature - Standard: 40GB; up to 60GB/ 80GB with black box - Factory Option: HDD heater for low temperature (-20C~55C) support
Bay 1	- Easy swappable bay for CD-ROM/COMBO Drive/ 2nd Battery
Keyboard	- Water-proof membrane keyboard - Factory Optional water-proof Rubber Keyboard - Factory Optional Back-light Rubber Keyboard
Pointing Device	A touch-sensitive control pad with resisting rain drops
PCMCIA	- Type II x 2 or Type III x 1 - CardBus support

Audio	AC97 Rev. 2.3 support; compatible digital controller Build-in Stereo 2W speakers
I/O Port	- Serial port×1 - USB 2.0 x 2 (Support boot from USB CD-ROM, current up to 1A) - CRT port x 1 - PS/2 port - Parallel port x1 - DC input x 1 - RJ-45 x 1 - RJ-11 x 1 - Microphone-in - Line-out - IR - Kingston Lock Hole -Docking Port (POGO, hot docking)  1. VODCK 2. DVMAIN 3. GND 4. GND 5. H8_SMB_DATA 6. GND 7. USB5+ 8. H8_SMB_CLK 9. DOCK_RI# 10. USB5- 11. SPDIFOUT 12. USBOC5# 13. USBP4+ 14. SUSB# 15. +3V 16. USBP4- 17. +5V 18. +5V 19. DOCK_IN# 20. Ignition 21. +5VA 22. AGND 23. MIC 24. AOUT_L 25. AOUT_R
Communication	- Integrated 10/100 base-T Ethernet - Integrated 56kbps Modem - Integrated Wireless LAN (Centrino platform) with 1 antenna - Factory Optional GPS module from USB with 1 antenna - Factory Optional wireless module from COM–GSM/GPRS/CDMA/CDPD with 1 antenna (Reserve iDen/DataTAC interface) - Factory Optional Bluetooth module from USB with 1 antenna - No any interference between 4 antennas in the same time
Battery	- Main battery supports over 5 hours (w/o M11 VGA Chipset) - Second battery supports over 3 hours
AC adapter	- 90 Watts Universal or above, auto sensing/ switching, fully support all the functions - Input: 100-240v, 50/60Hz AC

Dimensions & Weight	- 328x 272 x 41 mm (All the parts can't protrude this space.) (Depth: 272 mm is totally height, includes the antenna, hinge etc.) (The height of the bow is 7mm) - Under 3.2 kg
Software	- Support Windows 2000 - Support Windows XP Pro - Support Linux 9.x (Option)
Accessories	- Optional Vehicle Docking - Optional Office Docking - Optional Carrying Bag (same as A770) - Optional Car Adapter (same as A770) - Optional Battery Pack - Kensington lock
Office/ Vehicle Docking Board	- Serial Port x 2 (from USB) - Parallel Port x 1 (from USB) - BNC S-Video in for Video Capture (from USB) - USB Port x 2 (support current up to 1A) - POGO Docking Port - DC-in x1 - Microphone In x1 - Line-out x1 - Ignition sensor - Support charge function via car adapter. - Power on indicator - Support GPS and WWLAN pass through antenna - 6W+6W external speaker output
Office Docking Mechanical Design	- Support the board function - MITAC ME team design by sheet metal
Vehicle Docking Mechanical Design	- Support the board function - MITAC ME team design by sheet metal

Table 2.2 Internal Testing request

Environmental Standard (Main system)	
Temperature	IEC 68-2-1,2,14 / MIL-STD-810F, Method 501.4, 502.4 Operating: 0°C to 55° C (standard) -20° to 55° (optional) Non-operating: -20°C to 70° C
Humidity	According to IEC 68-2-30 / MIL-STD-810F, Method 507.4 5% to 95% RH, non-condensing
Altitude	According to IEC 68-2-13/ MIL-STD-810F, Method 500.4 Operating: 15,000ft; Non-operating: 40,000ft Attitude change rate: 2,000ft/min
Shock	According to IEC 68-2-27/ MIL-STD-810F, Method 516.5 Operating: 15g, 11ms, half sine wave Non-operating: 75g, 6ms, half sine wave
Drop	According to IEC 68-2-32 / MIL-STD-810F, Method 516.5 4 feet height free drop on steel plate Internal test 26 times/ one machine, total test 10 machines
Vibration	According to IEC 68-2-6 / MIL-STD-810F, Method 514.5 Operating: 10~55Hz/0.075mm, 55~500Hz/1.0g MIL-STD-810F, 514.5C1-high way truck vibration exposure Non-operating: 10~55Hz/0.15mm, 55~500Hz/2.0g MIL-STD-810F-514.5C-17 General minimum integrity exposure
ESD	Following IEC1000-4-2, Air Discharge: 0KV~8KV(included), no any error; 9KV~15KV, allow soft error Contact Discharge:0KV~6KV(included), no any error; 7KV~ 8KV, allow soft error
Enclosure	According to IEC 529, NEMA, MIL-STD-810F, Method 506.4, 510.4 IP 54 compliance
Regulation	FCC part 15, Subpart B, C, Class B, UL, CUL, TUV, CE! , CB, CCC, WHQL, BSMI
Others	- Support MIL-STD-461E - Pass explosive test (CSA Class 2.1)

2.1 CPU module

- Intel Centrino with Micro-FCBGA package.
- The processor supports MMX™
- The Streaming SIMD Extensions 2 (SSE2) enable break-through levels of performance in multimedia applications including 3-D graphics, video decoding/encoding, and speech recognition.
- Use Source-Synchronous Transfer (SST) of address and data to improve performance by transferring data four times per bus clock.
- Support Enhanced Intel SpeedStep® technology, which enables real-time dynamic switching of the voltage and frequency between two performance modes.

2.2 Synthesizer System frequency synthesizer: ICS950810

- Programmable output frequency, divider ratios, output rise/fall time, output skew.
- Programmable spread percentage for EMI control.
- Watchdog timer technology to reset system if system malfunctions.
- Programmable watchdog safe frequency.
- Support I^2C Index read/write and block read/write operations.
- Use external 14.318MHz crystal.

2.3 Intel 855-GME GMCH IGUI 3D Graphic DDR/SDR Chipset

- Intel 855-GME GMCH IGUI Host Memory Controller integrates a high performance host interface for Intel Centrino processor, a high performance 2D/3D Graphic Engine, a high performance memory controller, an AGP 4X interface, and Intel® I/O Hub architecture INTEL 82801DBM ICH4-M.
- Intel 855-GME GMCH Host Interface features the AGTL & AGTL+ compliant bus driver technology with integrated on-die termination to support Intel Pentium-M processors. 855-GME GMCH provides a 12-deep In-Order-Queue to support maximum outstanding transactions up to 12. It integrated a high performance 2D/3D Graphic Engine, Video Accelerator and Advanced Hardware Acceleration MPEGI/MPEGII Video Decoder for the Intel Pentium-M series based PC systems. It

also integrates a high performance 2.1GB/s DDR266(up to DDR333) Memory controller to sustain the bandwidth demand from the integrated GUI or external AGP master, host processor, as well as the multi I/O masters. In addition to integrated GUI, 855-GME GMCH also can support external AGP slot with AGP 1X/2X/4X capability and Fast Write Transactions. A high bandwidth and mature Intel®' I/O Hub architecture is incorporated to connect 855-GME GMCH and INTEL 82801DBM ICH4-Mtogether. Intel®' I/O Hub architecture is developed into three layers, the Multi-threaded I/O Link Layer delivering 1.2GB bandwidth to connect embedded DMA Master devices and external PCI masters to interface to Multi-threaded I/O Link layer, the Multi-threaded I/O Link Encoder/Decoder in INTEL 82801DBM ICH4-M to transfer data w/ 533 MB/s bandwidth from/to Multi-threaded I/O Link layer to/from 855-GME GMCH, and the Multi-threaded I/O Link Encoder/Decoder in 855-GME GMCH to transfer data w/ 533 MB/s from/to Multi-threaded I/O Link layer to/from INTEL 82801DBM ICH4-M.

- A Unified Memory Controller supporting DDR266/DDR333 DRAM is incorporated, delivering a high performance data transfer to/from memory subsystem from/to the Host processor, the integrated graphic engine or external AGP master, or the I/O bus masters. The memory controller also supports the Suspend to RAM function by retaining the CKE# pins asserted in ACPI S3 state in which only AUX source deliver power. The 855-GME GMCH adopts the Shared Memory Architecture, eliminating the need and thus the cost of the frame buffer memory by organizing the frame buffer in the system memory. The frame buffer size can be allocated from 8MB to 64MB.
- Processor/Host Bus Support.
- Intel® Pentium-M processor.
- 2X Address, 4X data.
- Support host bus Dynamic Bus Inversion (DBI).
- Supports system bus at 400MT/s (100 MHz).
- Supports 64-bit host bus addressing.
- 8-deep In-Order-Queue.
- AGTL+ bus driver technology with integrated GTL termination resistors and low

voltage operation (1.05V).

- Supports Enhanced Intel® SpeedStep™ Technology (EIST) and Geyserville III.
- Support for DPWR# signal to Pentium-M processor for PSB power management

2.4 Memory System

- Directly supports one DDR channel, 64-bts wide (72-b with ECC).
- Supports 266/333-MHz DDR devices with unbuffered PC2100 /PC2700 DDR (with ECC).
- Supports 128-Mb, 256-Mb and 512-Mbit technologies providing maximum capacity of 1-GB (up to 2-GB) with only x 16 devices.
- All supported devices have 4 banks.
- Supports up to 16 simultaneous open pages.
- Supports page sizes of 2KB, 4KB, 8KB, and 16KB. Page size is individually selected for every row.
- UMA support only

2.5 System interrupt

- Supports 8259 and Processor System Bus interrupt delivery mechanism.
- Supports interrupts signaled as upstream Memory Writes from PCI and Hub interface.
- MSI sent to the CPU through the system Bus.
- From IOxAPIC in ICH4-M.
- Provides redirection for upstream interrupts to the System Bus.
- Video Stream Decoder.
- Improved HW Motion Compensation for MPEG2.
- All format decoder (18 ATSC formats) supported.
- Dynamic Bob and Weave support for Video Streams.
- Software DVD at 60 fields/second and 30 frames/second full screen.
- Support for 720x480 pixel resolution DVD quality encoding at low CPU utilization.
- Video Overlay.

- Single high quality scalable overlay and second Sprite to support second overlay.
- Multiple overlay functionality provided via Arithmetic Stretch Bit.
- Independent Gamma Correction.
- Independent Brightness / Contrast / Saturation.
- Independent Tint / Hue support.
- Destination Color keying.
- Source Chromakeying.
- Maximum source resolution of 1920x1080 pixels.
- Maximum overlay clock of 133 MHz/200 MHz provides a pixel resolution up to 1600x1200@ 60Hz or 1280x1024@ 85 Hz.

2.6 Display

- Analog Display Support.
- 350 MHz integrated 24-bit RAMDAC that can drive a standard progressive scan analog monitor up to 1800x1350 @ 85 Hz.
- Accompanying I2C and DDC channels provided through multiplexed interface Hot plug and display support.
- Dual independent pipe with single display support Simultaneous: Same images and native display timings on each display device.
- DVO (DVOB) support.
- Digital video out port DVOB with 165-MHz dot clock on 12-bit interface.
- Variety of DVO devices channel.
- Compliant with DVI Specification 1.0, thereby providing support for a flat panel up to 2048x1536 pixel resolution, or digital CRT up to 1920x1080 pixel resolution.
- Dedicated LFP (local flat panel) interface.
- Single or dual channel LVDS panel support up to SXGA+ panel resolution with frequency range from 25MHz to 112MHz per channel.
- SSC support of 0.5%, 1.0%, and 2.5% center and down spread with external SSC clock.
- Supports data format of 18 bpp.
- LCD panel power sequencing compliant with SPWG timing specification.

- Compliant with ANSI/TIA/EIA –644-1995 spec.
- Integrated PWM interface for LCD backlight inverter control.
- Bi-linear Panel fitting.
- Tri-view support through LFP interface, DVO ports and CRT.
- Internal Graphics Features.
- Core Frequency.
- Display Core frequency of 133MHz.
- Render Core frequency of 133MHz.
- 2D Graphics Engine.
- Optimized 128 bit BLT engine.
- Ten programmable and predefined monochrome patterns.
- Alpha Stretch Blt (via 3D pipeline)
- Anti-aliased lines.
- Hardware-based BLT Clipping & Scissoring.
- 32-bit Alpha Blended cursor.
- Programmable 64*64 3-color Transparent cursor.
- Color Space Conversion.
- 3 Operand Raster BLTs.
- 8-bit, 16-bit, and 32-bit color.
- ROP support.
- DIB translation and Linear/Title addressing.
- 3D Graphics Engine.
- 3D Setup and Render Engine.
- Viewpoint Transform and Perspective Divide.
- Triangle Lists, Strips and Fans support.
- Indexed Vertex and Flexible Vertex formats.
- Pixel accurate Fast Scissoring and Clipping operation.
- Backface Culling support.
- DirectX™ and OGL Pixelization rules.
- Anti-Aliased Lines support.
- Sprite Points support.

- Zone Rendering.
- Provides the highest sustained fill rate performance in 32-bit color and 24-bit W mode.
- High quality performance Texture Engine.
- 266 MegaTexel/speak performance.
- Per Pixel Perspective corrected Texture Mapping.
- Single Pass Texture Compositing (Multi-Texture) at rate.
- Enhanced Texture Blending functions.
- Twelve Level of Detail MIP Map Sizes from 1x1 to 2Kx2K.
- Numerous Texture formats including 32-bit RGBA.
- Alpha and Luminance Maps.
- Texture Chromakeying.
- Bilinear, Trilinear, Anisotropic MIP-Mapped Filtering.
- Cubic Environment Reflection Mapping.
- Embossed Bump-mapping.
- DXTn Texture Decompression.
- 3D Graphics Rasterrization enhancements.
- One Pixel per Clock.
- Flat and Gouraud Shading.
- Color Alpha Blending for Transparency.
- Vertex and Programmable Pixel Fog and Atmospheric effects.
- Color Specular Lighting .
- Vertex and Programmable Pixel Fog and Atmospheric effects.
- Z Bais support.
- Dithering.
- Line and Full-Scence Anti-Aliasing.
- 16 and 24-bit Z Buffering.
- 16 and 24-bit W Buffering.
- 8-bit Stencil Buffering.
- Double and Triple Render Buffer support.
- 16 and 32 –bit color.

- Destination Alpha.
- Vertex Cache.
- Maximum 3D resolution of 1600x1200 x32 bpp at 85 Hz.
- Optimal 3D resolution supported.
- Fast Clear support.
- ROP support.

2.7 HUB Interface for ICH4

- 266 MB/s point to point hub interface to ICH4-M.
- 66-M Hz base clock.
- Supports the following traffic types to the ICH4-M.
- Hub interface-to DRAM.
- CPU-to-Hub interface.
- Messaging.
- MSI interrupt messages.
- Power Management state change.
- SMI, SCI, and SERR error indication.
- Power Management.
- SMRAM space remapping to A0000h (128-KB).
- Supports extended SMRAM space above 256- MB, additional 1 MB TSEG from top of Memory, cacheable (cache ability controlled by CPU).
- APM rev 1.2 compliant power management.
- Supports Suspend to System Memory (S3), Suspend to Disk (S4) and Hard Off/Total Reboot (S5).
- ACPI 1.0b, 2.0 Support.

2.8 I/O Controller Hub: INTEL 82801DBM

- The INTEL 82801DBM ICH4-M integrates three Universal Serial Bus 2.0 Host Controllers, the Audio Controller with AC 97 Interface, the IDE Master/Slave controllers, and Intel®' I/O Hub architecture. The PCI to LPC Bridge, I/O Advanced

Programmable Interrupt Controller, legacy system I/O and legacy power management functionalities are integrated as well.

- The integrated Universal Serial Bus Host Controllers features Dual Independent UHCI Compliant Host controllers with six USB ports delivering 480 Mb/s bandwidth and rich connectivity. Besides, Legacy USB devices as well as over current detection are also implemented.
- The Integrated AC97 v2.3 compliance Audio Controller that features a 7-channels of audio speaker out and HSP v.90 modem support. Additionally, the AC97 interface supports 4 separate SDATAIN pins that are capable of supporting multiple audio codes with one separate modem codec.
- The integrated IDE Master/Slave controller features Dual Independent IDE channels supporting PIO mode transfers up to 16 Mbytes/sec and Ultra DMA 33/66/100. It provides two separate data paths for the dual IDE channels that sustain the high data transfer rate in the multitasking environment.
- INTEL 82801DBM ICH4-M supports 6 PCI masters and complies with PCI 2.2 specification. It also incorporates the legacy system I/O like: two 82C37 compatible DMA controllers, Channels 0-3 are hardwired to 8 bit, three 8254 compatible programmable 16-bit counters channels 5-7, hardwired keyboard controller and PS2 mouse interface(not use in MiTAC 8080 model), Real Time clock with 512Bytes CMOS SRAM and two 82C59 compatible Interrupt controllers. Besides, the I/O APIC managing up to 14 interrupts with both Serial and FSB interrupt delivery modes is supported.
- The integrated power management module incorporates the ACPI 1.0b compliance functions, the APM 1.2 compliance functions, and the PCI bus power management interface spec. v1.1. Numerous power-up events and power down events are also supported. 21 general purposed I/O pins are provided to give an easy to use logic for specific application. In addition, the INTEL 82801DBM ICH4-M supports Deeper Sleep power state for Intel Mobile processor.
- A high bandwidth and mature Intel®' I/O Hub architecture is incorporated to connect Montara and Intel 82801DBM ICH4-M Hub interface together. Intel®' I/O Hub architecture is developed.

- Features.
- PCI Bus Interface.
- Supports PCI Revision 2.2 Specification at 33 MHz.
- 133 MB/sec maximum throughput.
- Supports up to six master devices on PCI.
- One PCI REQ/GNT pair can be given higher arbitration priority (intended for external 1394 host controller).
- Support for 44-bit addressing on PCI using DAC protocol Integrated LAN Controller.
- WfM 2.0 and IEEE 802.3 compliant.
- LAN Connect Interface (LCI).
- 10/100 Mbit/sec Ethernet support_ Integrated IDE Controller.
- Supports “Native Mode” register and interrupts.
- Independent timing of up to 4 drives, with separate primary and secondary IDE cable connections.
- Ultra ATA/100/66/33, BMIDE and PIO modes.
- Tri-state modes to enable swap bay.
- USB Includes three UHCI host controllers that support six external ports.
- New: Includes one EHCI high-speed USB 2.0 Host Controller that supports all six ports.
- New: Supports a USB 2.0 high-speed debug port.
- Supports wake-up from sleeping states S1–S5.
- Supports legacy keyboard/mouse software AC-Link for Audio and Telephony CODECs.
- Supports AC ’97 2.3.
- New: Third AC_SDATA_IN line for three codec support.
- New: Independent bus master logic for seven channels (PCM In/Out, Mic 1 input, Mic 2 input, modem in/out, S/PDIF out).
- Separate independent PCI functions for audio and modem.
- Support for up to six channels of PCM audio output (full AC3 decode).
- Supports wake-up events Interrupt Controller.
- Support up to eight PCI interrupt pins.

- Supports PCI 2.2 message signaled interrupts.
- Two cascaded 82C59 with 15 interrupts.
- Integrated I/O APIC capability with 24 interrupts.
- Supports serial interrupt protocol.
- Supports processor system bus interrupt delivery New: 1.5 V operation with 3.3 V I/O.
- 5 V tolerant buffers on IDE, PCI, USB overcurrent and legacy signals Timers Based on 82C54.
- System timer, refresh request, speaker tone output Power Management Logic.
- ACPI 2.0 compliant.
- ACPI-defined power states (C1–C2, S3–S5).
- Supports Desktop S1 state (like C2 state, only STPCLK# active).
- ACPI power management timer.
- PCI PME# support.
- SMI# generation.
- All registers readable/restorable for proper resume from 0 V suspends states External Glue Integration.
- Integrated pull-up, pull-down and series termination resistors on IDE, processor interface.
- Integrated Pull-down and Series resistors on.

2.9 Super I/O_NS PC87393

- National Semiconductor's PC8739x family of LPC Super I/O devices is targeted for a wide range of portable applications. PC99 and ACPI compliant, the PC8739x family features an X-Bus Extension for read and write operations over the X-Bus, a full IEEE 1284 Parallel Port with a Parallel Port Multiplexer (PPM) for external Floppy Disk Drive (FDD) support, a Musical Instrument Digital Interface (MIDI) port, and a Game port. Like all National LPC Super I/O devices, the PC8739x offers a single-chip solution to the most commonly used PC I/O peripherals.
- The PC8739x family also incorporates: a Floppy Disk Controller (FDC), two enhanced Serial Ports (UARTs), one with Fast Infrared (FIR, IrDA 1.1 compliant),

General-Purpose Input/Output (GPIO) support for a total of 32 ports, Interrupt Serializer for Parallel IRQs and an enhanced WATCH DOG timer.

2.10 Keyboard controller Hitachi H8/3437

- The H8/3437 Series is a series of high-performance microcontrollers with a fast H8/300 CPU core and a set of on-chip supporting functions optimized for embedded control. These include ROM, RAM, four types of timers, a serial communication interface, optional I2C bus interface, host interface, A/D converter, D/A converter, I/O ports, and other functions needed in control system configurations, so that compact, high-performance systems can be implemented easily. The series includes the H8/3437 with 60-kbyte ROM and 2-kbyte RAM, the H8/3436 with 48-kbyte ROM and 2-kbyte RAM, and the H8/3434 with 32-kbyte ROM and 1-kbyte RAM.
- The H8/3437, H8/3436, and H8/3434 are available in mask-ROM versions. The H8/3437 and H8/3434 are also available in ZTAT™*1 (zero turn-around time) versions, providing a quick and flexible response to conditions from ramp-up through full-scale volume production, even for applications with frequently-changing specifications. In addition, the H8/3434 and H8/3437 have F-ZTAT™*2 (flexible-ZTAT) versions with on-board programmability.

2.11 Fax/Modem module

- The PCT2303W chipset is designed to meet the demand of this emerging worldwide AMR/MDC market. The combination of PC-TEL's well proven PCT2303W chipset and the HSP56TM MR software modem driver allows systems manufactures to implement modem functions in PCs at a lower bill of materials (BOM) while maintaining higher system performance.
- PC-TEL has streamlined the traditional modem into the Host Signal Processing (HSP) solution. Operating with the Pentium class processors, HSP becomes part of the host computer's system software. It requires less power to operate and less physical space than standard modem solutions. PC-TEL's HSP modem is an easily

integrated, cost-effective communications solution that is flexible enough to carry you into the future.

- The PCT2303W chip set is an integrated direct access arrangement (DAA) and Codec that provides a programmable line interface to meet international telephone line requirements. The PCT2303W chip set is available in two 16-pin small outline packages (AC'97 interface on PCT303A and phone-line interface on PCT303W). The chip set eliminates the need for an AFE, an isolation transformer, relays, opto-isolators, and 2-to 4-wire hybrid. The PCT2303W chip set dramatically reduces the number of discrete components and cost required to achieve compliance with international regulatory requirements. The PCT2303W complies with AC'97 Interface specification Rev. 2.1. The chip set is fully programmable to meet worldwide telephone line interface requirements including those described by CTR21, NET4, JATE, FCC, and various country-specific PTT specifications. The programmable parameters of the PCT2303W chip set include AC termination, DC termination, ringer impedance, and ringer threshold. The PCT2303W chip set has been designed to meet stringent worldwide requirements for out-of-band energy, billing-tone immunity, lightning surges, and safety requirements.

2.12 FAST ETHERNET CONTROLLER—Realtek RTL8100CL

- The Realtek RTL8100CL is a highly integrated, cost-effective single-chip Fast Ethernet controller that provides 32-bit performance, PCI bus master capability, and full compliance with IEEE 802.3u 100Base-T specifications and IEEE 802.3x Full Duplex Flow Control. It also supports the Advanced Configuration Power management Interface (ACPI), PCI power management for modern operating systems that are capable of Operating System Directed Power Management (OSPM) to achieve the most efficient power management possible.
- In addition to the ACPI feature, the RTL8100CL also supports remote wake-up (Microsoft® wake-up frame) in both ACPI and APM environments. The RTL8100CL is capable of performing an internal reset through the application of auxiliary power. When auxiliary power is applied and the main power remains off, the RTL8100CL is ready and waiting for the Magic Packet or Link Change to wake the system up. Also,

the LWAKE pin provides 4 different output signals including active high, active low, positive pulse, and negative pulse. The versatility of the RTL8100CL LWAKE pin provides motherboards with Wake-On-LAN (WOL) functionality.

- The RTL8100CL also supports Analog Auto-Power-down, that is, the analog part of the RTL8100CL can be shut down temporarily according to user requirements or when the RTL8100C(L) is in a power down state with the wakeup function disabled. In addition, when the analog part is shut down and the IsolateB pin is low (i.e. the main power is off), then both the analog and digital parts stop functioning and the power consumption of the RTL8100CL will be negligible. The RTL8100CL also supports an auxiliary power auto-detect function, and will auto-configure related bits of their own PCI power management registers in PCI configuration space.
- The RTL8100CL keeps network maintenance costs low and eliminates usage barriers. It is the easiest way to upgrade a network from 10 to 100Mbps. It also supports full-duplex operation, making 200Mbps bandwidth possible at no additional cost. To improve compatibility with other brands. Products, the RTL8100CL is also capable of receiving packets with InterFrameGap no less than 40 Bit-Time. The RTL8100CL is highly integrated and requires no .glue. Logic or external memory.

2.13 PCMCIA controller_ ENE CB1420 + ENE CP2216

- CP2216 is a dual slot PCMCIA and Card Bus power switch. It integrates control logic, low switching resistance MOSFET, over current alarm and over temperature auto shutdown circuits. It can deliver 3.3V or 5V to PC Card xVCCOUT and 3.3V, 5V or 12V to PC Card xVPPOUT. The output current is up to 1A for xVCCOUT and 250mA for xVPPOUT. The power is controlled by 3-wire serial data interface CLOCK, DATA and LATCH.
- Low Switching Resistance (100mΩ for VCC Switch).
- Over current alarm via OC#.
- Over temperature auto shutdown.
- 1A output current for xVCCOUT.

- 150mA output current for xVPPOUT.
- Only 3.3V is required for chip normal operation.
- 12V is not required for 3.3V or 5V Output.
- Break-Before-Mask Switching.
- 32-Pin SSOP Package (209 mil).

2.14 AC”97 Codec ALC203

- Single chip audio CODEC with high S/N ratio (>100dB).
- Compliant with AC’97 2.3 specifications.
- Support of S/PDIF out is fully compliant with AC’97 rev2.3 specifications.
- Meets performance requirements for audio on PC99/2001 systems.
- Meets Microsoft WHQL/WLP 2.0 audio requirements.
- 18-bit Stereo full-duplex CODEC with independent and variable sampling rate.
- 18-bit ADC and 20-bit DAC resolution.
- Three analog line-level stereo inputs with 5-bit volume control: LINE_IN, CD, AUX.
- High quality differential CD input.
- Two analog line-level mono inputs: PCBEEP, PHONE_IN.
- Supports double sampling rate (96 KHz) of DVD audio playback.
- Two software selectable MIC inputs.
- +6/12/20/30dB boost preamplifier for MIC input.
- Stereo output with 6-bit volume control and Mono output with 5-bit volume control.
- Headphone output with 50mW/20Ω. driving capability (ALC202).
- 3D Stereo Enhancement.
- Multiple CODEC extension capability.
- External Amplifier Power down (EAPD) capability.
- High performance converter technology.
- Power management and enhanced power saving.
- 2 GPIO pins with smart GPIO volume control.
- No external crystal/clock required.
- 14.318MHz 24.576MHz PLL saves crystal.
- DC Voltage volume control.

- Auxiliary power (VAUX) to support Power Off CD.
- Standard 48-Pin LQFP package.

2.15 Thermal sensor_ ADM1022

- On-Chip and Remote Temperature Sensing.
- No Calibration Necessary.
- 1_C Accuracy for On-Chip Sensor.
- 3_C Accuracy for Remote Sensor.
- Programmable Over/Under Temperature Limits.
- Programmable Conversion Rate.
- 2-Wire SMBus Serial Interface.
- Supports System Management Bus (SMBus) Alert.
- 200 _A Max Operating Current.
- 1 _A Standby Current.
- 3 V to 5.5 V Supply.
- Small 16-Lead QSOP Package.

2.16 System Flash Memory (BIOS)

- 4M bit Flash memory.
- Flashed by 5V only.
- User can upgrade the system BIOS in the future just running flash program.
- See Software BIOS Specification.

2.17 Operating System Compatibility

Win 2K / Win XP PRO / Linux 9.x.

3 Other Functions

3.1 Hot Key Function

Keys Combination	Feature	Meaning
Fn + F1	Backlight	Toggles keyboard backlight on/off
Fn + F2	Reserved	
Fn + F3	Volume Down	Decreases the sound volume
Fn + F4	Volume Up	Increases the sound volume
Fn + F5	Brightness Down	Decreases LCD brightness
Fn + F6	Brightness Up	Increases LCD brightness
Fn + F7	LCD backlight switch	Toggle LCD backlight on or off
Fn + F8	LCD panel toggle on/off	Toggle Display Screen on or off.
Fn + F9	Display switch	Only Support LCD->CRT->LCD&CRT. System didn't do display switch function When No connecting CRT, system always display on LCD.
Fn + F10	System sleep	System sleep button function.
Fn + F11	Wireless LAN on/off	Switches mini-PCI: Wireless LAN on/off
Fn + F12	GPS on/off	Switches GPS function on/off

3.2 Power on/off/suspend/resume button

APM mode

At APM mode, Power button is on/off system power.

ACPI mode

At ACPI mode. Windows power management control panel set power button behavior. You could set "standby", "power off" or "hibernate"(must enable hibernate function in power Management) to power button function. Continue pushing power button over 4 seconds will force system off at ACPI mode.

3.3 Cover Switch

System automatically provides power saving by monitoring Cover Switch. It will save battery power and prolong the usage time when user closes the notebook cover.
At ACPI mode there are four functions to be chosen at windows power management control panel.

1. None

2. Standby
3. Off
4. Hibernate (must enable hibernate function in power management)

3.4 LED Indicators

ON M/B LED:

D22：Temperature/AC Power LED (red/green)

D23：Battery charge/Battery complete LED (orange/green)

D24：Wireless LAN active/link LED (orange/green)

When wireless LAN shows Green led, It means wireless link. (It means AP to wireless module connection.)

Description:

Active-high LED signal provides an indication of access point association. This signal will blink slowly every 3 seconds until association occurs at while time it will be HIGH until association is lost. During initialization or which the radios are in reset, the signal will be low. When wireless LAN shows yellow led, it means wireless active.

Description:

Active-high LED signal provides an indication of data activity. This signal will blink rapidly when data traffic is occurring. During initialization, or while the radios are in reset, or if the client is not association with an access point the signal will be low.

D25：Wireless modem RX/TX LED (orange/green)

D26：Battery Low LED (orange)

D27：CD-ROM active LED (orange)

D28：+12VS indicated LED

D29：+5VS indicated LED

D30：+3VA indicated LED

D31：DDR_2.5V indicated LED

D32：+3VS indicated LED

3.5 Battery status

Battery Warning

- System also provides Battery capacity monitoring and gives user a warning so that users have chance to save his data before battery dead. Also, this function protects system from mal-function while battery capacity is low.
- Battery Warning: Capacity below 10%, Battery Capacity LED flashes per second.

Battery Low State

- After Battery Warning State, and battery capacity is below 4%, Battery Capacity LED flashes per second,

Battery Dead State

- When the battery voltage level reaches 9.32 volts, system will shut down automatically in order to extend the battery packs' life.

3.6 CMOS Battery

- CR2032 3V 220mAh lithium battery
- When AC in or system main battery inside, CMOS battery will consume no power.
- AC or main battery not exists, CMOS battery life at less (220mAh/5.8uA) 4 years.
- Battery was put in battery holder, can be replaced.

3.7 Connector Description

I/O Port – USB *2(J10/J11)

Two USB 2.0 Port

Supports UHCI Design Guide

Connector: Foxconn UB1113C-K1, 4 pins SMT type, male, R/A & Shroud connector

Power supply for device: 5Vdc, 1Amp.

Support USB FDD Boot up function.

DC Input (PJ1)

Connector: 信音 2MJ-0402A120, 4- pin Power jack connector

PCMCIA Socket (J15)

Dual slot, support two type-II or one type-III PC Card.

Socket Type: Top Side of PCB.

PS2 Port (J2)

PS2 connector for keyboard and mouse.

To I/O Board interface connector (J3)

Interface included: USB*1(Bluetooth use) , COM1, COM3(Touch screen use), CRT, PIO, Microphone, Line out, Keyboard signal, LAN TX/RX, LVDS, +3V, +3VS, +5V, +5VS, DVMAIN(+19V), LCD_+3VS(LCD use).

POGO Interface (J504)

Interface included: USB 2.0 * 2 , Microphone, SPDIFOUT, Ignition, SMB BUS, Line out, Ring signal, +5VA, +5V, +3V, VDOCK(+19V), DVMAIN(+19V).

Touch PAD connector (J512)

Connector: ELCO, 00-6239-012-800, 12-pin connector.

Antenna switch connector (J4, J5, J6, J7, J502, J503)

J4~J7 Connector: MMCX, RMM22-5T52000.

J502, J503 Connector: IMS manufactory, it passes antenna signal from system to docking for using vehicle dock.

ITP700FLEX test connector (J501)

Connector: ELCO, 04-6239-028-001-800, 28-pin connector.

LED connector (J8)

Connector: ELCO, 00-6226-010-800, 10-pin connector.

H8 flash connector (J505)

Connector: HIROSE, DF13-12P-1.25V, 12-pin connector.

GPS connector (J9, J500)

J9 connector for 茂綸 GPS module.

J500 connector for 鴻方 GPS module.

CD-ROM connector (J12)

Connector : 凡甲, C1240Y-25001.

HDD connector (J17)

Connector: HIROSE, FX2-52P-0.635SH, 52 pin.

X-BAY interface connector (J13)

This connector is for wireless modem module.

Interface included: USB 2.0*1, Board ID, COM4, SMB Bus, system GPIO*2, Microphone, Line in signal, +5V, +5VA, +12V, +3V, DVMAIN (+19V).

Modem connector (J14)

Connector: AMP, 3-179397-0.

Battery connector (PJ2, PJ3)

PJ2 Connector: Main battery connector.

PJ3 Connector: Secondary battery connector.

4 Peripheral Components

4.1 LCD PANEL

Support 12.1” TFT XGA LCD display, Resolution up to XVGA (1024*768), 18-bit color.

Brightness: 100 ±10 lux

Interface: LVDS

4.2 HDD

Toshiba 40GB

4.3 Keyboard

- Water-proof membrane keyboard
- Factory Optional water-proof Rubber Keyboard
- Factory Optional Back-light Rubber Keyboard

Windows 88 Keyboard, multi languages support, US and Europe Keyboard

4.4 Track Pad Synaptic

- Accurate positioning
- Low fatigue pointing action
- Low profile
- No moving part, high reliability
- Low power consumption
- Environmentally sealed
- Compact size.
- Software configurable
- Low weight
- Operating humidity: 5%-95% relative humidity, non condensing
- Storage temperature: -40 to +65 degree C
- ESD: 15KV applied to front surface

- Power supply voltage: 5.0Voltage ± 10%
- Power supply current: 4.0mA max operating.

4.5 Memory

DDR-RAM/Microm//256M/512M

DDR-RAM/Kingston//256M/512M

DDR-RAM/Infineon//512M

4.6 Modem MDC

Askey

5 Power management

The Tetra system has built in several power saving modes to prolong the battery usage. User can enable and configure different degrees of power management modes via ROM CMOS setup (booting by pressing F2 key). Following are the descriptions of the power management modes supported.

5.1 System Management Mode

Full on mode

In this mode, each device is running with the maximal speed. CPU clock is up to its maximum.

Doze Mode

In this mode, CPU will be toggling between on & stop grant mode either. The technology is clock throttling. This can save battery power without loosing much computing capability.The CPU power consumption and temperature is lower in this mode.

Standby mode

For more power saving, it turns of the peripheral components. In this mode, the following is the status of each device:

--CPU: Stop grant

--LCD: backlight off

--HDD: spin down

Suspend to DRAM

The most chipset of the system is entering power down mode for more power saving. In this mode, the following is the status of each device:

Suspend to DRAM

--CPU: off

--Twister K: Partial off

--VGA: Suspend

--PCMCIA: Suspend

--Audio: off

--SDRAM: self refresh

Suspend to HDD

--All devices are stopped clock and power-down

--System status is saved in HDD

--All system status will be restored when powered on again

5.2 Other power management functions

5.2.1 HDD & Video access

System has the ability to monitor video and hard disk activity. User can enable monitoring function for video and/or hard disk individually. When there is no video and/or hard disk activity, system will enter next PMU state depending on the application. When the VGA activity monitoring is enabled, the performance of the system will have some impact.

Specification for Docking Board

I/O Port	-- USB to Serial Port x 2 --USB2.0 x 2 ◎USB to Parallel Port x 1 ◎Microphone ◎Line-out signal
Environmental Standard	
Temperature	IEC 68-2-1,2,14 / MIL-STD-810F, Method 501.4, 502.4 Operating: 0°C to 55°C -20 °C to 55 °C (Optional) Non-operating: -20°C to 70°C
Vibration	Test with SDI docking mechanism, According to IEC 68-2-6 Sinusoidal wave vibration: Operating: 10~55Hz/0.075, 55~500Hz/1.0Hz Non-operating: 10~55Hz/0.15, 55~500Hz/2.0Hz Random vibration: MIL-STD-810F, 514.5 - high way truck vibration exposure
ESD	Test with SDI docking mechanism, According to IEC1000-4-2 Air Discharge: 0kV~8kV(included), no any error 8 kV~15 KV, allow soft error Contact Discharge: 0kV~4kV(included), no any error 4kV~ 8KV, allow soft error

5.2.2 Regulation Approval

Main System

Category	Standard
EMI/EMC	FCC Part15 Class B
	CISPR 22 CLASS B
Safety	UL/CUL
	TUV
	3C
	CE

5.2.3 System Power Consumption & Battery Life

Power Consumption & Battery Lift

Battery	Watts	Test program	Full Run Battery Life
Main	66.6WHr	Battery Mark4.01	Around 300 minutes (w/o M11 VGA Chipset)

Battery Life of -20℃ ambient (Optional)

Battery	Watts	Test program	Full Run Battery Life
Main	66.6WHr	Battery Mark4.01	At least 90 minutes (charge above 25℃, discharge at -20℃)

The maximum battery capacity on -20degrees C is 60% of 25 degrees C.

5.2.4 Operating System Support

Support O.S

Windows 2000

Windows XP PRO

Linux 9.x (option)

7 System View

7.1 Right-Side Components

Ref	Component	Description
❶	**Primary Battery Pack**	Supplies power to your computer when external power is not connected.
❷	**PC Card Slot**	Accepts a PC card for additional functions.
❸	**USB Ports**	Each of the two ports connects a USB device, such as a USB floppy drive, printer, digital camera, joystick, and more.
❹	**PS/2 Port**	Connects a PS/2 keyboard and/or mouse.

7.2 Left-Side Components

Ref	Component	Description
❶	**CD/Combo/ DVD RW Drive**	Accepts a compact disc (CD) for installing or loading software, accessing data, and playing music/video.
	Secondary Battery Pack	You can purchase a secondary battery pack that supplies power to your computer when external power is not connected.
❷	**Hard Disk Drive Slot**	Inside is the hard disk drive of your computer.

7.3 Rear Components

Ref	Component	Description
❶	**IR Port**	Connects an IrDA-compliant device for wireless data transfer.
❷	**Power Connector**	Connects the AC adapter.
❸	**Serial Port**	Connects a serial device, such as an external modem.
❹	**RJ-11 Connector**	Connects the telephone line.
❺	**RJ-45 Connector**	Connects the LAN cable.
❻	**VGA Port**	Connects an external monitor.
❼	**Parallel Port**	Connects a parallel device, such as a printer.
❽	**Microphone Connector**	Connects an external microphone.
❾	**Audio Output Connector**	Connects a set of headphones, external speakers with amplifier, an audio recording device, or an S/PDIF device such as a digital speaker set for digital audio output.

7.4 Front Components

Ref	Component	Description
❶	**Top Cover Latch**	Locks the top cover.
	Device Indicators	Show the current status of the computer's devices.
	⏚	AC power indicator. Glows green when the computer is using AC power. Blinks green when the computer, using AC power, is in Standby mode.

		Battery Charge Indicator Glows green when the battery is fully charged and connected to AC power. Glows amber when the battery is being charged. Blinks red when the battery is almost completely discharged.
		Battery Power Indicator Glows green when the computer is using battery power. Blinks green when the computer, using battery power, is in Standby mode.
		CD/Combo/DVD RW drive in-use indicator
		Wireless LAN (Local Area Network) indicator
		Wireless modem indicator
		Wired LAN indicator
❸	**Touchscreen Pen** (option)	Provides a convenient way to use the touchscreen. Can be stretched for better grip and handling.
❹	**Handle**	Allows you to carry your computer for an easy grip.
❺	**Kensington Lock**	Locks the computer to a stationary object for security.

7.5 Bottom-Side Components

Ref	Component	Description
❶	**SIM Card Slot**	Contains the SIM card slot for using the GPS function.
❷	**Release Knob**	Allows you to remove the CD/Combo/DVD RW drive as well as eject the secondary battery pack.
❸	**Docking Connector (POGO)**	For connecting to a Port Replicator / car mount (both are available as an option).
❹	**Memory Slot**	Contains the memory slot for expanding the memory size of your computer.
❺	**Stereo Speaker Set**	Sends out sound and voice from the computer.

7.6 Top-open Components

Ref	Component	Description
❶	**Power Button**	Turns the computer power ON and OFF.
❷	**LCD Screen**	Displays the output of the computer.
❸	**Device Indicators**	Show the current status of the computer's devices.
		Power On Indicator
		Glows green when the computer is on.
		Blinks green when the computer is in Standby mode.
		Hard Disk Drive Indicator
		Blinks green when the hard disk drive is active.
		Blinks red when the hard disk heater is on.
		Scroll Lock indicator
		Num Lock indicator

		Caps Lock indicator
❹	**Keyboard**	Serves as the data input device of the computer.
❺	**Touchpad**	Serves as the pointing device of the computer.

8 System Disassembly

8.1 Battery pack and HDD driver

1. Open the battery door. (Fig 1)
2. Pull the battery holder out. (Fig 2)
3. Open the HDD driver door. (Fig 3)
4. Pull the HDD driver out. (Fig 4)

Fig 1

Fig 2

Fig 3

Fig 4

8.2 CD ROM driver

1. Open the CD ROM door. (Fig 1)
2. Put the notebook upside down and put the ejector direct then turn right. (Fig 2, Fig3)

Fig 1

Fig 2

Fig 3

8.3 Keyboard

1. Open the top cover then remove five screws. (Fig 1)
2. Turn to back then remove four screws. (Fig 2)
3. Open the top cover to 180 degree then slightly lift up the hinge cover. (Fig 3)
4. Remove four screws and open bracket then disconnect keyboard. (Fig 4, Fig 5)

Fig 1

Fig 2

Fig 3

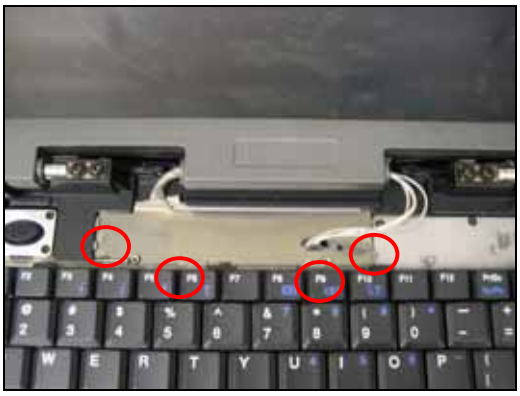


Fig 4

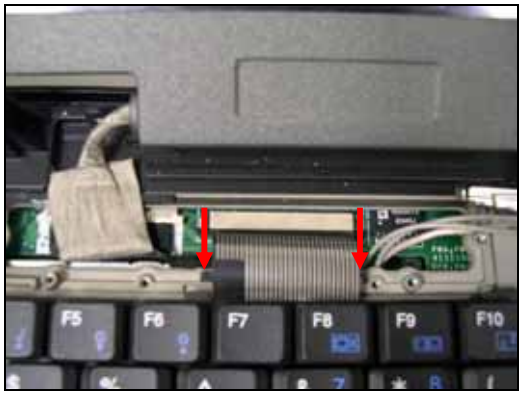


Fig 5

8.4 Wireless LAN card and Modem card

1. Remove keyboard and nine screws then open bracket. (Fig 1, Fig 2)
2. Disconnect wireless cable then remove wireless LAN card. (Fig 3)
3. Remove two screws and cable then slightly lift up the Modem board. (Fig 4)

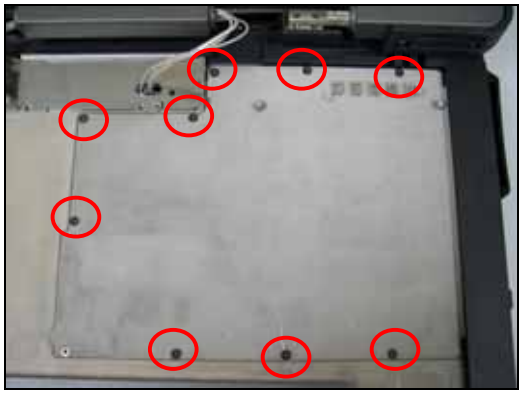


Fig 1

Fig 2

Fig 3

Fig 4

8.5 DDR memory

1. Put the notebook upside down then remove nine screws. (Fig 1)
2. Open the memory cover then remove DDR memory. (Fig 2)

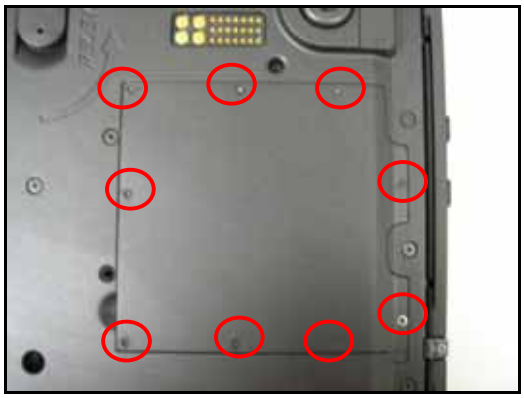


Fig 1

Fig 2

8.6 Main board

1. Remove thirty-five screws and six stand-off screws. (Fig 1, Fig 2)
2. Open the bottom cover then remove eight screws and touch pad cable. (Fig 3)
3. Lift up Main board.

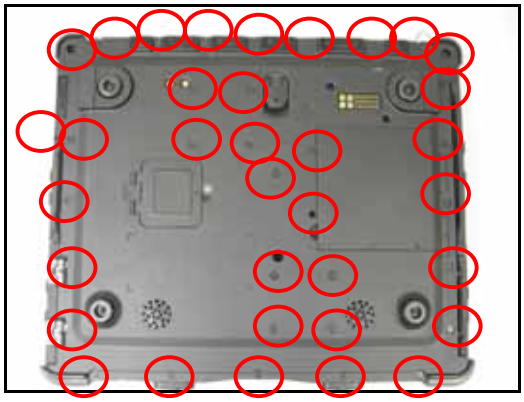


Fig 1

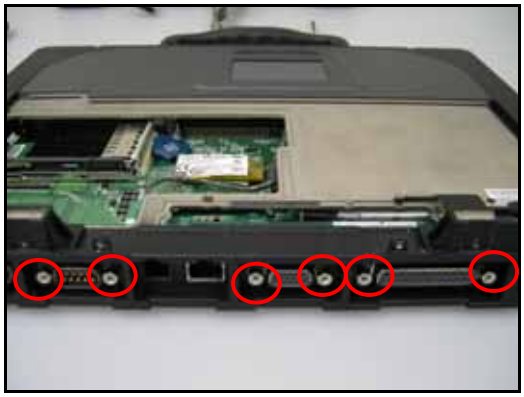


Fig 2

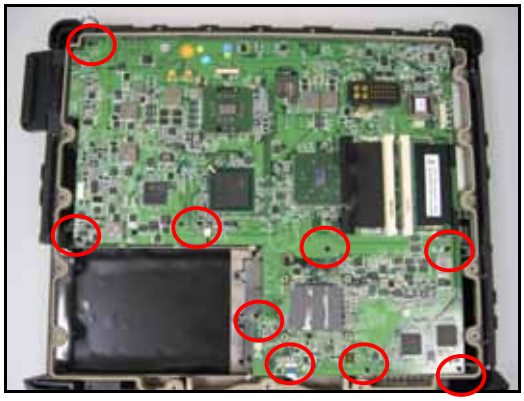


Fig 3

8.7 LCD panel and touch screen

1. Remove four corner rubbers. (Fig 1)
2. Remove eight screws. (Fig 2)
3. Remove right side of LCD housing and left side six screws. (Fig 3, Fig 4)
4. Open the LCD cover carefully then lift up LCD panel slowly and disconnect inverter cable, VGA cable. (Fig 5, Fig 6)
5. Disconnect Touch screen cable. (Fig 7)

Fig 1

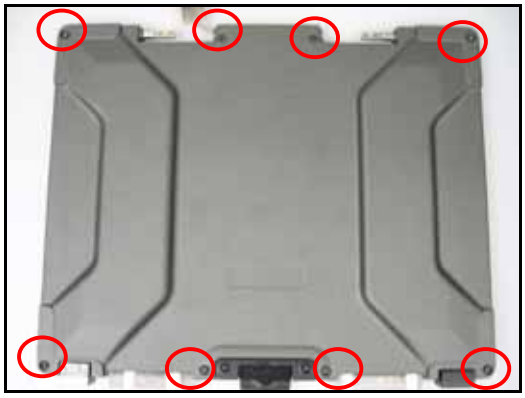


Fig 2

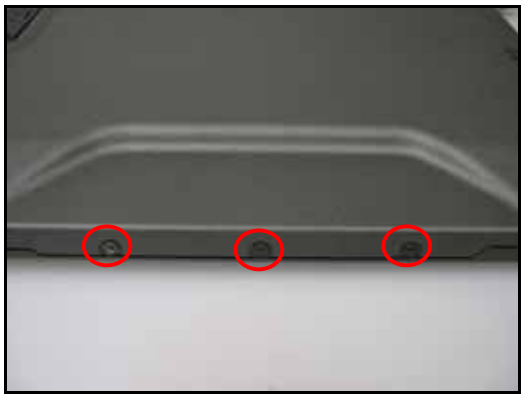


Fig 3

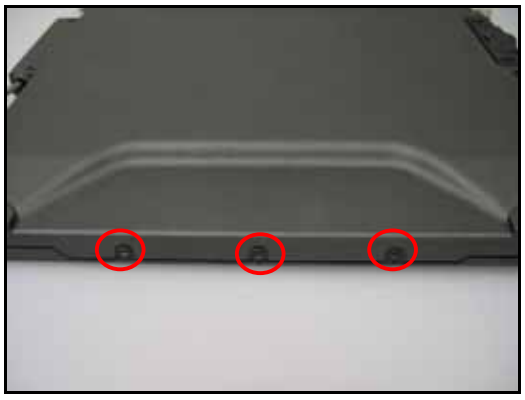


Fig 4

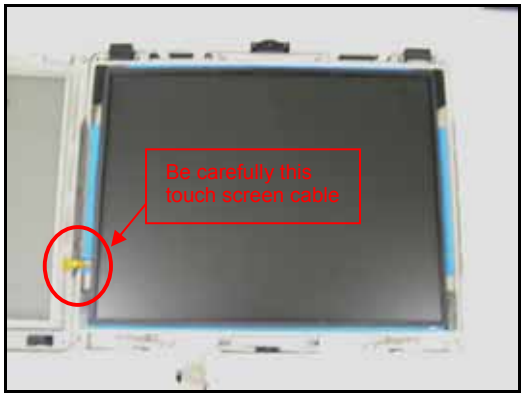


Fig 5

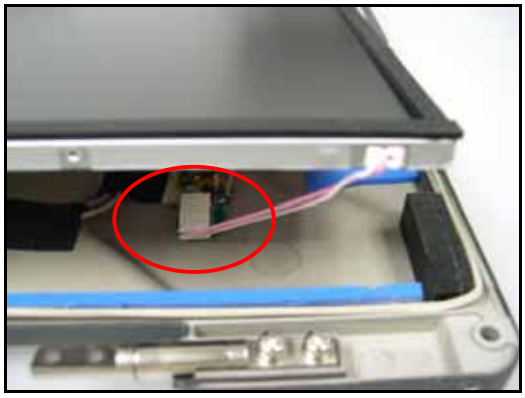


Fig 6

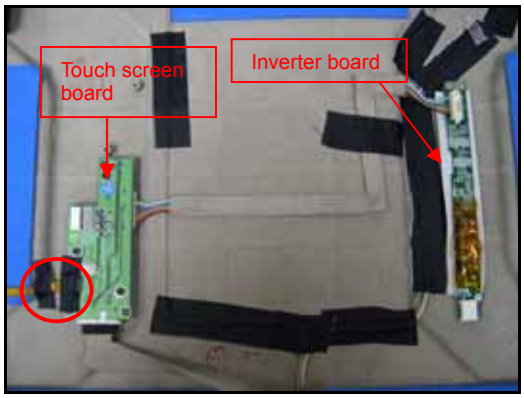
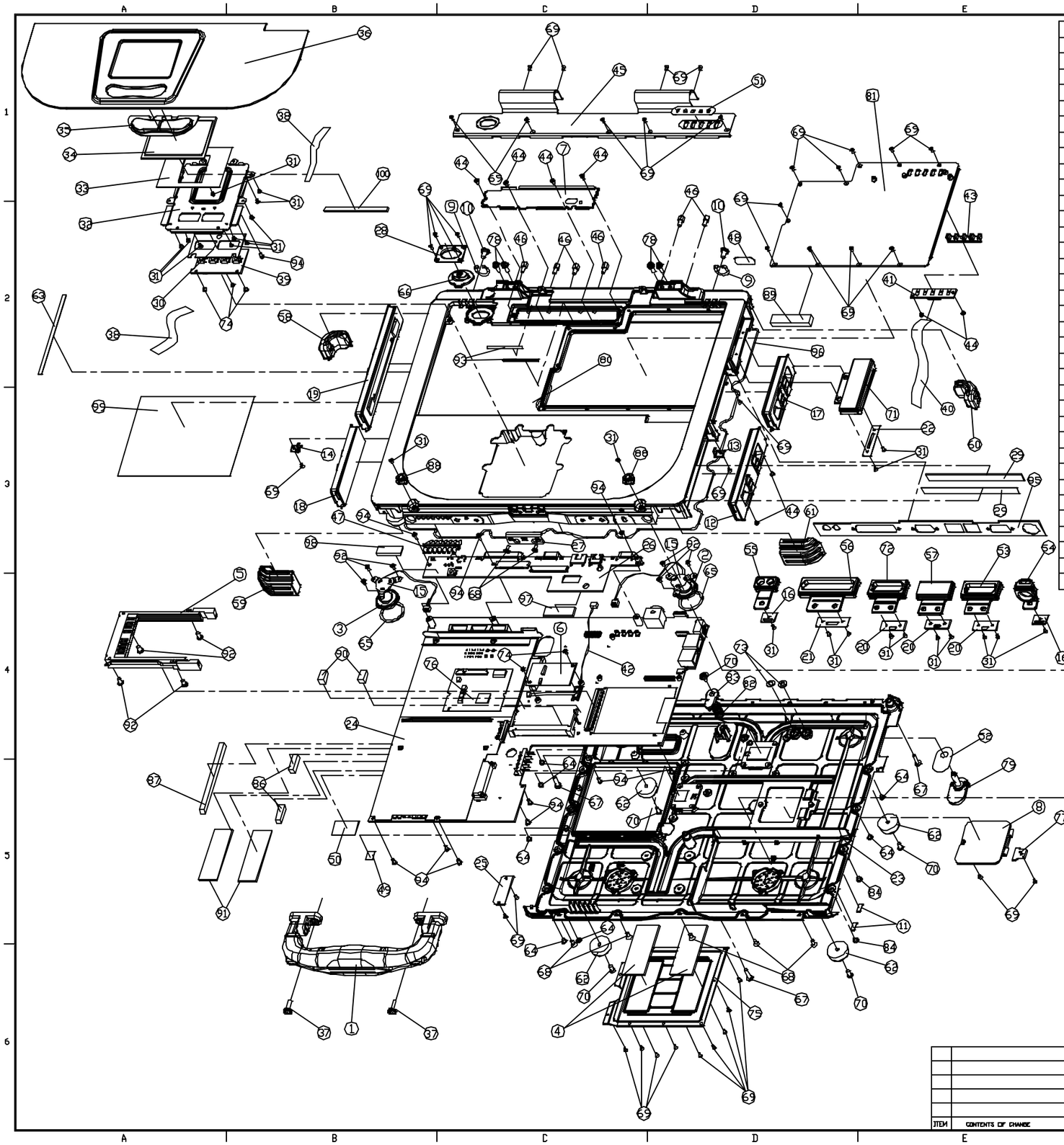


Fig 7



ITEM	PART_NO.	PART_NAME	QTY
100	7961150700031	TF-GASKET;CAP TOUCH PAD,W8xH2xL30.5,M220	1
99	7961150700026	TF-GASKET;C-part C0 ram top,M220	1
98	7961150700019	TF-GASKET;I/O B0 conduct pad,W7H3L80,M220	1
97	7961150700021	TF-GASKET;LAN+Modem con,W9 H3 L3(,M220	1
96	3461200000E	GASKET;d=L6,CAP5	1
95	7961150600033	TF-MYLAR;BATT,M220	2
94	7970.1192060	TF-SCR;M2.5L6,RND,FE,ZNB,NYLOK	13
93	7961150600049	TF-RUBBER;LCD KEYBOARD,CABLE,M220	2
92	7971019020040	TF-SCR;M2L4,THIN,FE,ZNB,NYLOK	10
91	7961150600046	TF-RUBBER,DOR,BOTTOM,M220	2
90	7961150600048	TF-RUBBER;MINI PCI,BOTTOM,M220	2
89	7961150600047	TF-RUBBER;X BAY,M220	1
88	7961150700031	TF-HOLDER PROTECT HOOK,M220	2
87	7961150600044	TF-RUBBER;DOR,LONG,M220	1
86	7961150600045	TF-RUBBER;DOR,SHORT,M220	2
85	7961150700024	TF-GASKET;I/O Bracket,W22.8 T0.6 L233,M220	1
84	7970100303011	TF-SCR;M3L3,PAN,FE,BCT,NLK	2
83	7961150300019	TF-RELEASE,HANDLE,DVD,M220	1
82	7961150200019	TF-SPRING;RELEASE,HANDLE,M220	1
81	7961150911115	TF-COVER;X-BAY,M220	1
80	7961150000117	TF-TOP HOUSING ASSY;MAIN-SYS,M220	1
79	7961150000116	TF-ASSY;CD ROM,RELEASE MODULE,M220	1
78	7970H1403080	SCR;M3L8,BND/SF,FE,NIW,NLK	4
77	7961150200017	TF-BKT;COVER,SIM-CARD,M221	1
76	4126788000001	FAX-MODEM-MODEL	1
75	7961151900021	TF-COVER;IDR,M220	1
74	7971104021120	SCR;M2L2,THIN,FE,NIV,NYLOK	5
73	7961150600321	TF-RUBBER;SMT,SWITCH,DOCKING,M22	2
72	7961150600011	TF-CAP;CRT,M220	1
71	7961150600261	TF-CAP;USB-PS2,M220	1
70	7970N1303061	SCR;M3L6,WASHER HEAD,FE,BCT,NLK	5
69	7970K1918040	SCR;M2L4,FLT,FE,ZNB,NLK	41
68	7970K11A2061	TF-SCR;M2.5L6,FLT,FE,BCT,NLK	25
67	7970J1303120	TF-SCR;M3L12,RND,FE,BCT,NLK	3
66	7961150611115	TF-BUTTON;POWER,M220	1
65	7961150611114	TF-RUBBER;SPEAKER,M220	2
64	7970111130501	TF-SCR;M3L5,PAN,FE,BCT,NLK	7
63	7961150700231	TF-GASKET;C PART CD-ROM LOW EDGE,W5 H0.5 L128,M220	L
62	7961150600010	TF-RUBBER;FOOT,M220	4
61	7961150600009	TF-CORNER RUBBER;R-F,MAIN SYS,M2	L
60	7961150600008	TF-CORNER RUBBER;R-R,MAIN SYS,M2	L
59	7961150600007	TF-CORNER RUBBER;L-F,MAIN SYS,M2	L
58	7961150600006	TF-CORNER RUBBER;L-R,MAIN SYS,M2	L
57	7961150600005	TF-CAP;R.U1-RJ45,M220	1
56	7961150600004	TF-CAP;PRINT-PORT,M220	1
55	7961150600003	TF-CAP;PHONE-JACK,M220	1
54	7961150600002	TF-CAP;DC-IN,M220	1
53	7961151160027	TF-CAP;COM PORT,M220	1
52	7961151150029	TF-MYLAR;RELEASE,HANDLE,DVD,M220	1
51	7961151150026	TF-MYLAR;LED,HINGE-COVER,M221	1
50	7961150700041	TF-THERMAL PAD;CPU,M220	1
49	7961150700031	TF-THERMAL PAD;NORTHBRIDGE,M220	1
48	7961151150022	TF-LENS;IR,M220	1
47	7961151050004	TF-LED;FN-DISPLAY,M220	1
46	7977614437394	STANDOFF,M4-40DP3.5HSL 5.5NOV,NLK	6
45	7961151300026	TF-COVER;HINGE,M220	1
44	7970101902030	TF-SCR;M2L3,THIN,FE,ZNB,NYLOK	8
43	7961151050005	TF-LED;POWER,M220	1
42	4221300000119	CABLE ASSY;MB TO MODEM,M220	1
41	411151000151	PWA;PVA-M220,LED BD	1
40	4221500000311	FFC ASSY;LED BD TO M/B,IDP,1.0MM,M221	1
39	411150000712	PWA;PVA-M220,TRACK PAD SW BD	1
38	4221400000011	FFC ASSY;TOUCH PAD,W120	2
37	7961150100005	TF-SCREW;M3-L15-7D,M220	2
36	7961150500011	TF-COVER;PALM-REST,M220	1
35	7961151160031	TF-RUBBER MODULE;R-L,M220	1
34	4426705000003	TOUCH PAD MODULE;KGIDFR03A,ALPS	1
33	7961150511135	TF PLATE_TP_ALPS,M220	1
32	7961150200041	TF-BKT;TOUCH PAD,M221	1
31	7970K1902030	SCR;M2L3,FLT,FE,BCT,NLK	84
30	7961150511120	TF-MYLAR;TP-PCB,M220	1
29	7961150511134	TF-MYLAR;BATT SIDE-WALL,M220	2
28	7961150300021	TF-BKT;POWER BUTTON,M221	1
27	7961150200018	TF-BKT;HOOK,FIX,M220	1
26	411150000291	PWA;PVA-M220,I/O B0	1
25	7961150200016	TF-BKT;DOCKING-SLOT,D-PART,M221	2
24	411150000011	PWA;PVA-M220,M/B	1
23	7961150000231	TF-BOTTOM COVER ASSY;MAIN SYS,M220	1
22	7961150200011	TF-BKT;USB-PS2-DOOR,M220	1
21	7961150200010	TF-BKT;PRINT-PORT-DOOR,M220	1
20	7961150200091	TF-BKT;CRT-DOOR,M220	3
19	7961151000015	TF-DOOR;CD ROM ASSY,M221	L
18	7961150000112	TF-DOOR;HDD ASSY,M220	L
17	7961151000013	TF-DOOR;PCMCIA ASSY,M220	L
16	7961150200051	TF-BKT;DC-DOOR,M220	2
15	7961150200031	TF-BKT;SPEAKER,M220	2
14	7961150200021	TF-BKT;CD ROM-HDD DOOR,M220	L
13	7961150220011	TF-BKT;BATT-PCMCIA DOOR,M221	L
12	7961151000014	TF-DOOR;BATT ASSY,M220	L
11	7961150600301	TF-RUBBER;STOPER,SIM,COVER,M220	2
10	7961150100081	TF-SCREW;BELT,M220	2
9	7961150100041	TF-RONSS;BELT,M221	2
8	7961151000016	TF-ASSY;SIM-CARD MODULE,M221	1
7	7961150000291	TF-COVER ASSY;LCD-KEY-CONN,M220	1
6	412GBB2500007	PCB ASSY;FAX MODEM 56K;1456VQL44A	1
5	3446100002571	IC CARD CON PART;68PIN,W/O COVER	1
4	7961150700021	TF-THERMAL PAD;DDR,M220	2
3	3391310000791	SPEAKER ASSY;Ø23MM,2W,4OHM,L=80MM	1
2	3391310000781	SPEAKER ASSY;Ø23MM,2W,4OHM,L=210MM	1
1	7961140031142	HOLDER GROUP;W-SERIES	1

TOL ± RANGE	X0	X2	X3	X5	FA	FB	C	B
0-6	.05	0.1	.15	0.2	.05	0.1	0.5	.15
6-30	0.1	0.2	.15	.25	0.1	.25	1	.15
30-80	.15	.25	0.2	0.3	0.2	0.4	2	.25
80-180	.15	0.3	.25	.45	0.4	0.8	3	.25
180-315	0.2	0.5	0.4	0.6	0.6	1.2	3	0.3
315-800	0.3	0.8	0.7	1.1	0.8	1.5	4	0.5

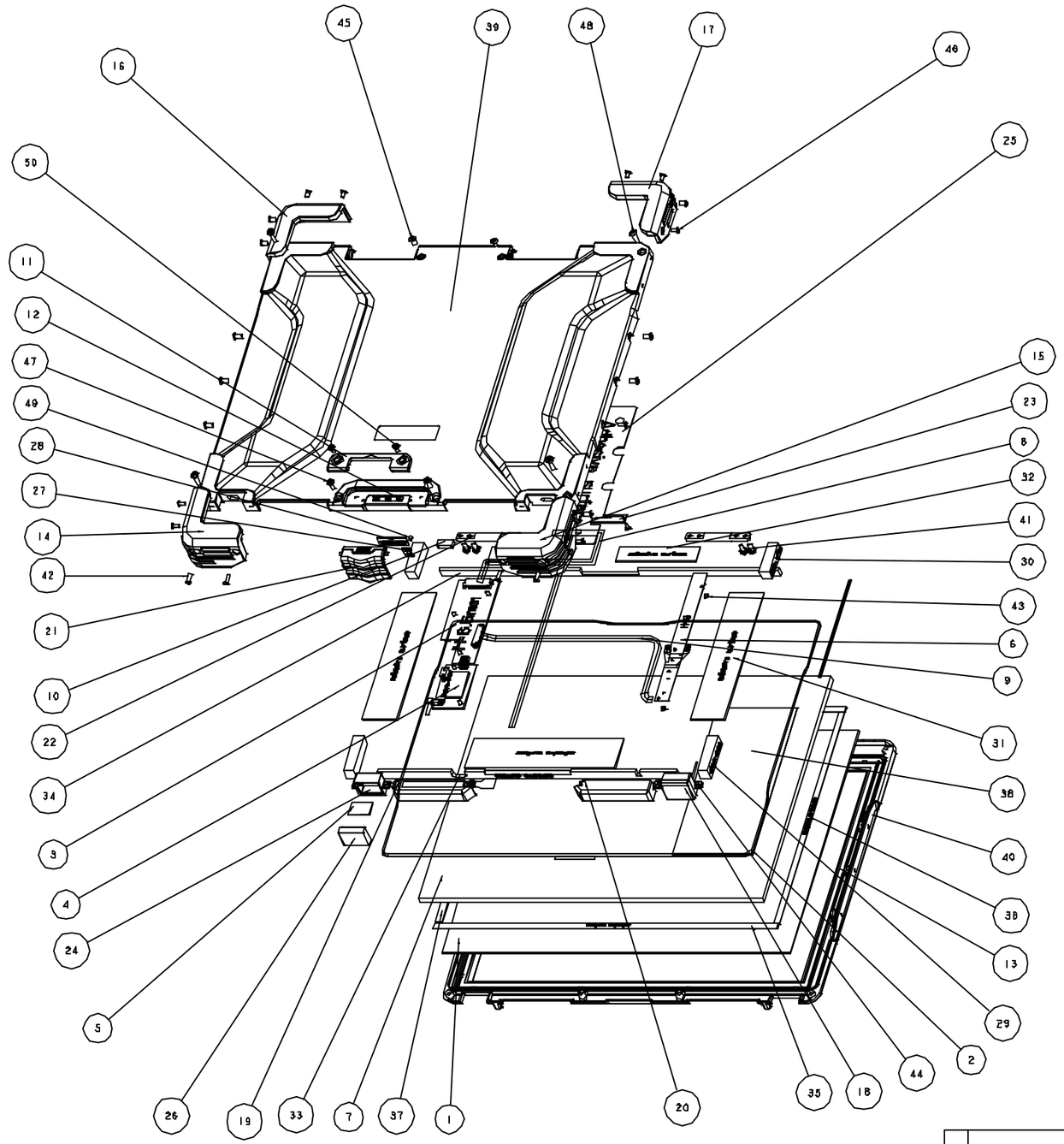
ITEM	CONTENTS OF CHANGE	REVS	CHK	APV	M/D/Y
					/ /
					/ /
					/ /
					/ /
					/ /
					/ /

DATE	11-Dec-11	MATERIAL	SEE NOTES	TREATMENT	REMARK
UNIT	MM	SCALE	0.500	DRAWING NAME	HOUSING ASSY;MBD,14G,M220
DESIGNED	CHECKED	CHECKED	APPROVED	MATERIAL NO.	MF 791911150001 R 00

MiTAC Technology Corp.

model name:791911150001 file name:791911150001

SHEET NO. 1 OF 1



ITEM	PART_NO.	PART_NAME	QTY	NOTE
50	19T0N19B2060	SCR;B2.5L8,T-type/SF,FE,ZNB,NYLOK	2	
49	19TGK19D2D30	SCR;B2L3,FLT ZNB,NLK	1	
48	19T0J1103120	TF-SCR;M3L12,BND,FE,BCT,NLK	4	
47	19TQJ11B3D80	SCR;B3L8,BBB,FE,BCT,NLK	2	
46	19T011982050	SCR;B2.5L5,TRIN,FE,NIB,NLK	17	
45	19TQ119B3D50	SCR;B3L6,TRIB,ZNB,NYLOK	8	
44	19T011402050	SCR;B2L5,TRIB,FE,NIW,NYLOK	10	
43	19TQ114D2D30	SCR;B2L3,TRIB,FE,NIW,NYLOK	2	
42	19T011182D80	SCR;B2.5L8,PAN,FE,BCT,NLK	4	
41	19TQH14D3D80	SCR;B3L8,BBB/SF,FE,NIW,NLK	4	
40	19B115Q9QD04	TF-BEZEL;LCD,14.1,M220	1	
39	19B115Q9QD03	TF-B085IBG;LCD,14.1,M220	1	
38	19B115QTQD27	TFB41-SPR100;LCD CU FOIL CONDUCTIVE,W7*T0.03*L130,M220	1	
37	19B115Q86D10	TFB41-LCD RUBBER;216.5*6*1.5T,M220	1	
36	19B115Q86D09	TFB41-LCD RUBBER;216.5*4.5*1.5T,M220	1	
35	19B115Q86D08	TFB41-LCD RUBBER;296*5.6*1.5T,M220	2	
34	19B115Q86D07	TFB41-LCD SPONGE;DOWN,295*8*3T,M220	1	
33	19B115Q86D06	TFB41-LCD SPONGE;TOP,260*8*3T,M220	1	
32	19B115Q86D05	TFB41-LCD SPONGE;TD*15*2T,M220	2	
31	19B115Q86D04	TFB41-LCD SPONGE;-130*30*2T,M220	3	
30	19B115Q86D03	TFB41-LCD RUBBER;30*10*9T,M220	2	
29	19B115Q86D02	TFB41-LCD RUBBER;35*10*9T,M220	2	
28	19B115Q86D23	TF-B09B;LCD,RUBBER,M220	1	
27	19B115Q50D32	TF-B09B,LCD,PLASTIC,M220	1	
26	19B115Q50D25	TF-B09;COVER,BLUETOOTH,M220	1	
25	19B115Q50D18	TF-B7LAN;INVERTER,M220	1	
24	19B115Q50D10	TF-B09;HOUSING,BLUETOOTH,M220	1	
23	19B115Q30D22	TF-PARTITION;LCD CABLE,M220	1	
22	19B115Q20D20	TF-HINGE;DOT SHAFT,M220	2	
21	19B115Q10D07	TF-B09B;LCD,SUS,M220	1	
20	19B115Q00D14	TF-WLAN ANTENNA;ASSY,M220	1	
19	19B115Q00D13	TF-GPRS ANTENNA;ASSY,M220	1	
18	19B115Q00D11	TF-GPS ANTENNA;ASSY,M220	1	
17	19B115Q00D10	TF-CORNER RUBBER;D-R,ASSY,M220	1	
16	19B115Q00D08	TF-CORNER RUBBER;D-L,ASSY,M220	1	
15	19B115Q00D09	TF-CORNER RUBBER;T-R,ASSY,M220	1	
14	19B115Q00D07	TF-CORNER RUBBER;T-L,ASSY,M220	1	
13	19B114460010	DOUBLE TAPE;3M,#4809,4MM*0.8MM+3M	1	
12	19B114420D04	SPRING;B06M,W-130	3	
11	19B114031D04	CAP;B06M,BLACK,W120	1	
10	19B1123TQD03	MAGNET;11.9*5.9*2MM,2000GAUSS	1	
9	4221150D0D02	CABLE ASSY;T/S BD TO INV & SENSOR,M220	1	
8	4221130D0D01	CABLE ASSY;MDB TO T/S BD ALCD,M220	1	
7	413080Q0581	LCD;B141EW06,TFT,14.1",XGA,AU OPTRONICS	1	
6	4121130D0D05	INVERTER ASSY;DA-1A08-102,HTI3X34-110,1.4X19-11	1	
5	4111150D0D17	PWA;PWA-M220,BLUETOOTH ANT BD	1	
4	4111130D0D12	PWA;PWA-M220,BLUE TOOTH BD	1	
3	4111150D0D14	PWA;PWA-M220,TOUCH SCREEN BD	1	
2	34B121D0D02	GASKET;4:1.6,CA25	1	
1	34B115D0D02	TORCH SCREEW;14.1",PANJIT	1	

TOL:								
RANGE	M1	M2	S1	S2	P1	P2	C	R
0~6	.03	0.1	.15	0.2	.05	0.1	0.3	.15
6~30	0.1	0.2	.15	.25	0.1	.15	1	.15
30~84	.13	.25	0.2	0.3	0.2	0.4	2	.25
80~180	.13	0.3	.25	.45	0.4	0.6	3	.25
180~315	0.2	0.3	0.4	0.6	0.8	1.2	5	0.3
315~540	0.3	0.5	0.7	1.1	0.8	1.5	4	0.3

DATE	29-Sep-04	MATERIAL	SEE NOTE6	TREATMENT	
UNIT	MM	SCALE	0.500	DRAWING NAME	UPPER ASSY;M220-4N
DESIGNED	CHECKED	CHECKED	APPROVED	MATERIAL NO.	AD 791911150020 R00

REMARK

MITAC Technology Corp.

model name:CASE_AB_14_ASSY_04

file name:791911150020